

COUPP-2L at SNOLAB

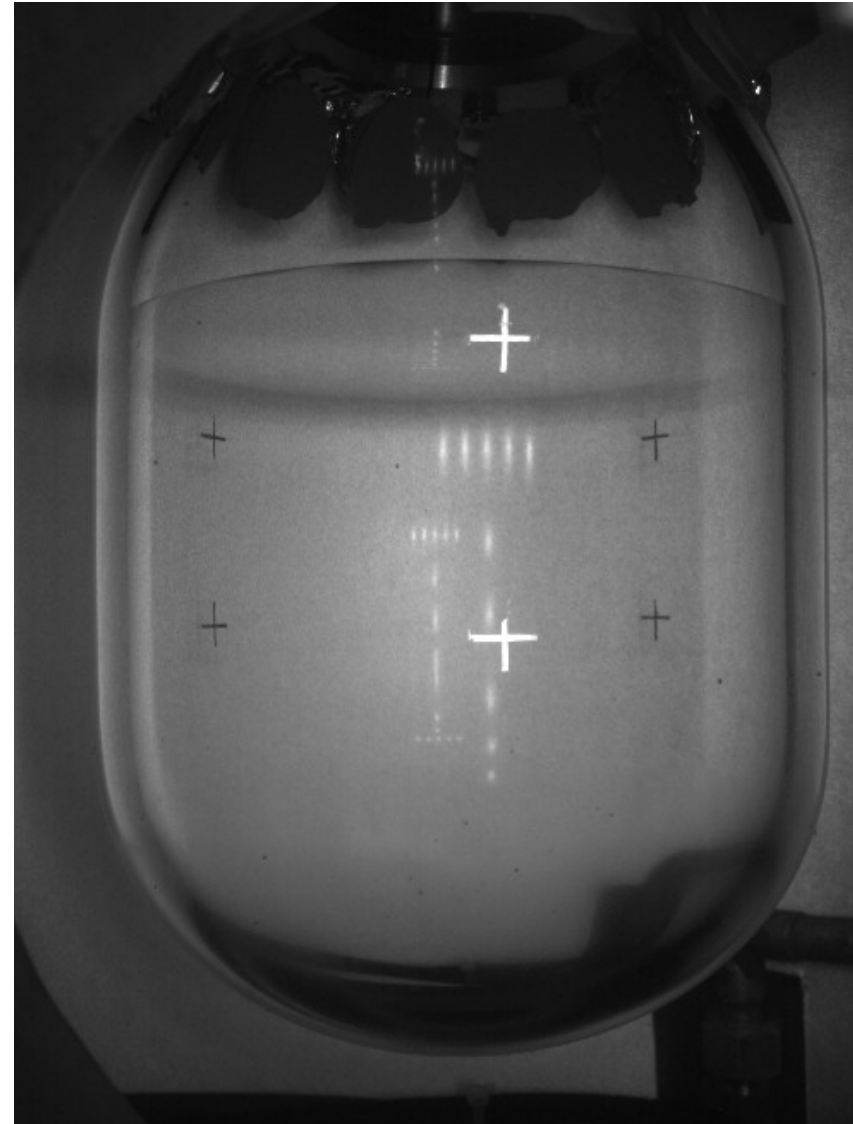
Bubble Chamber Dark Matter Search

Alan Robinson, University of Chicago
Monday March 28, 2011



Installation and calibration runs

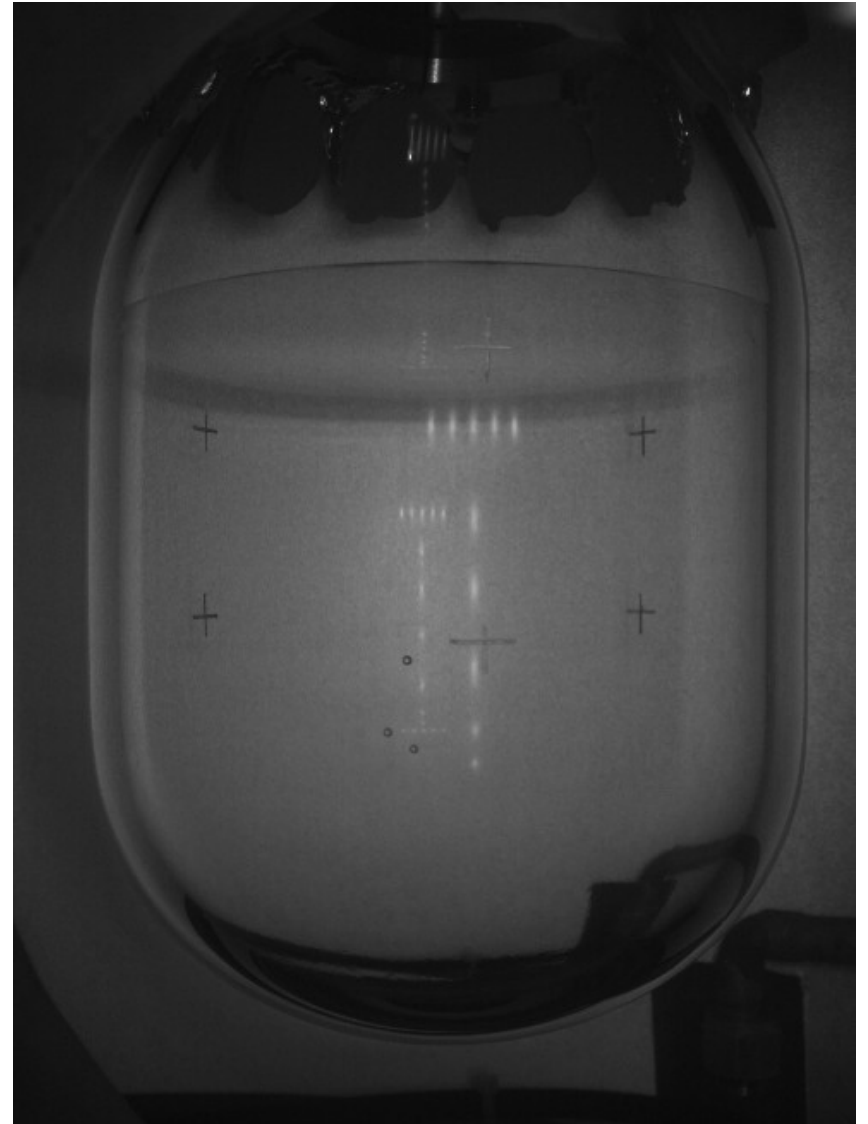
- Demonstrated safe remote operation
- Selected run conditions
- Fixed
 - Pinhole air leak.
 - Compressed air supply manifold
 - Glycol leak, 2mL/day

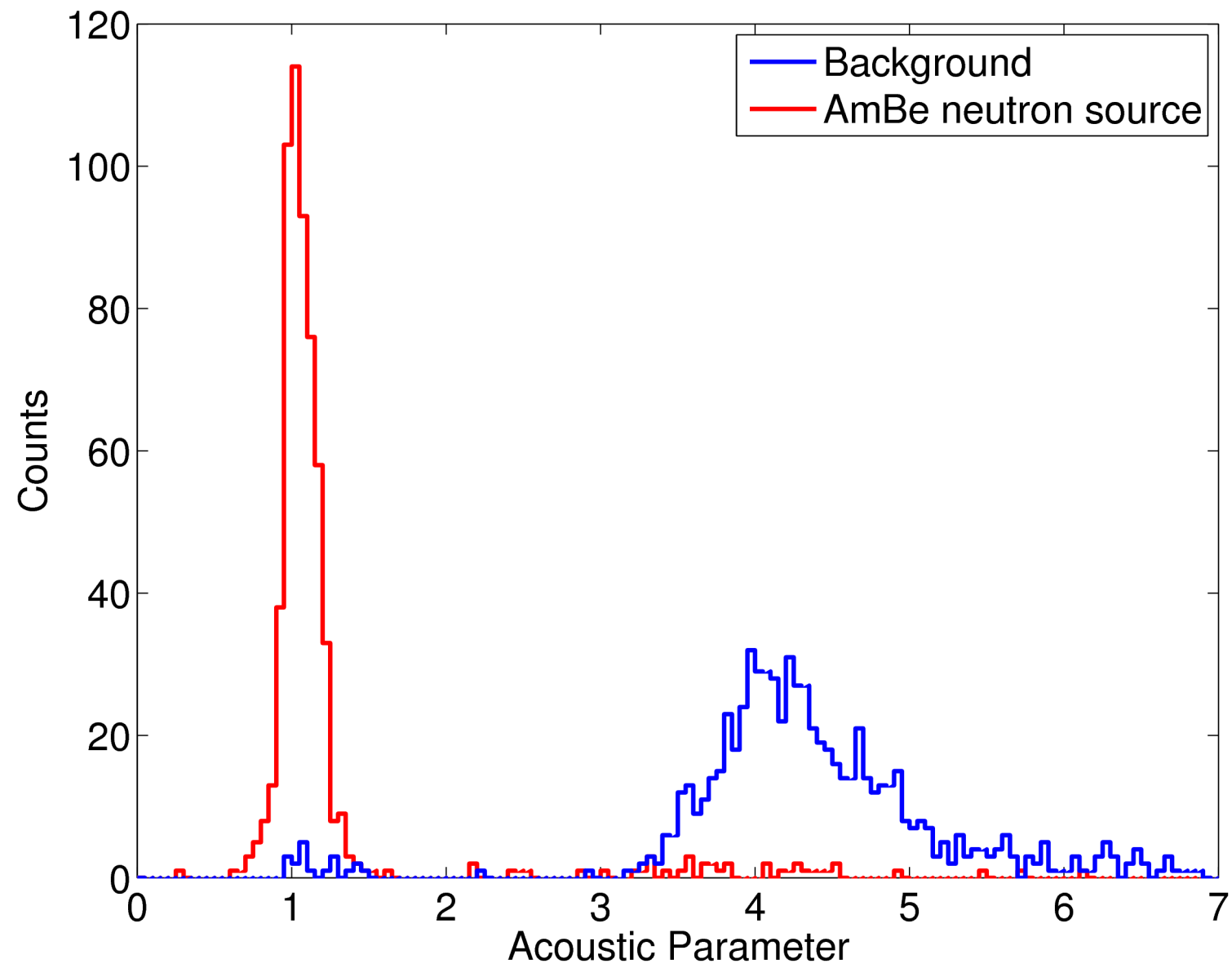




Backgrounds

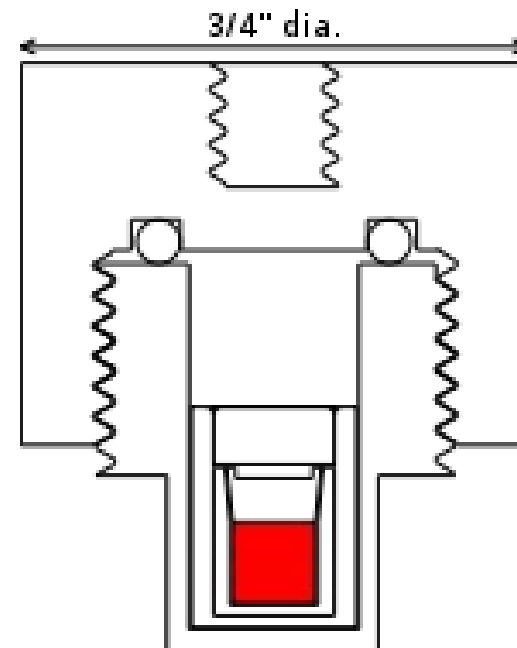
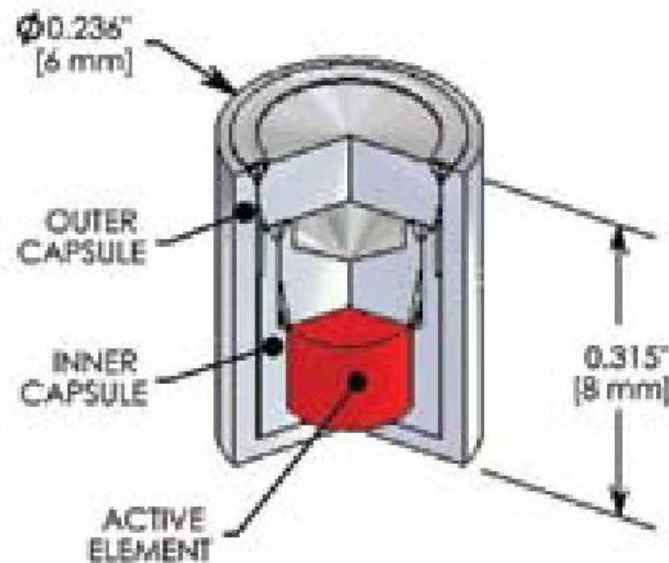
- Unexpected neutron background
- Potential gamma backgrounds
- Radon influx (alpha source)
 - Demonstrates our acoustic discrimination.





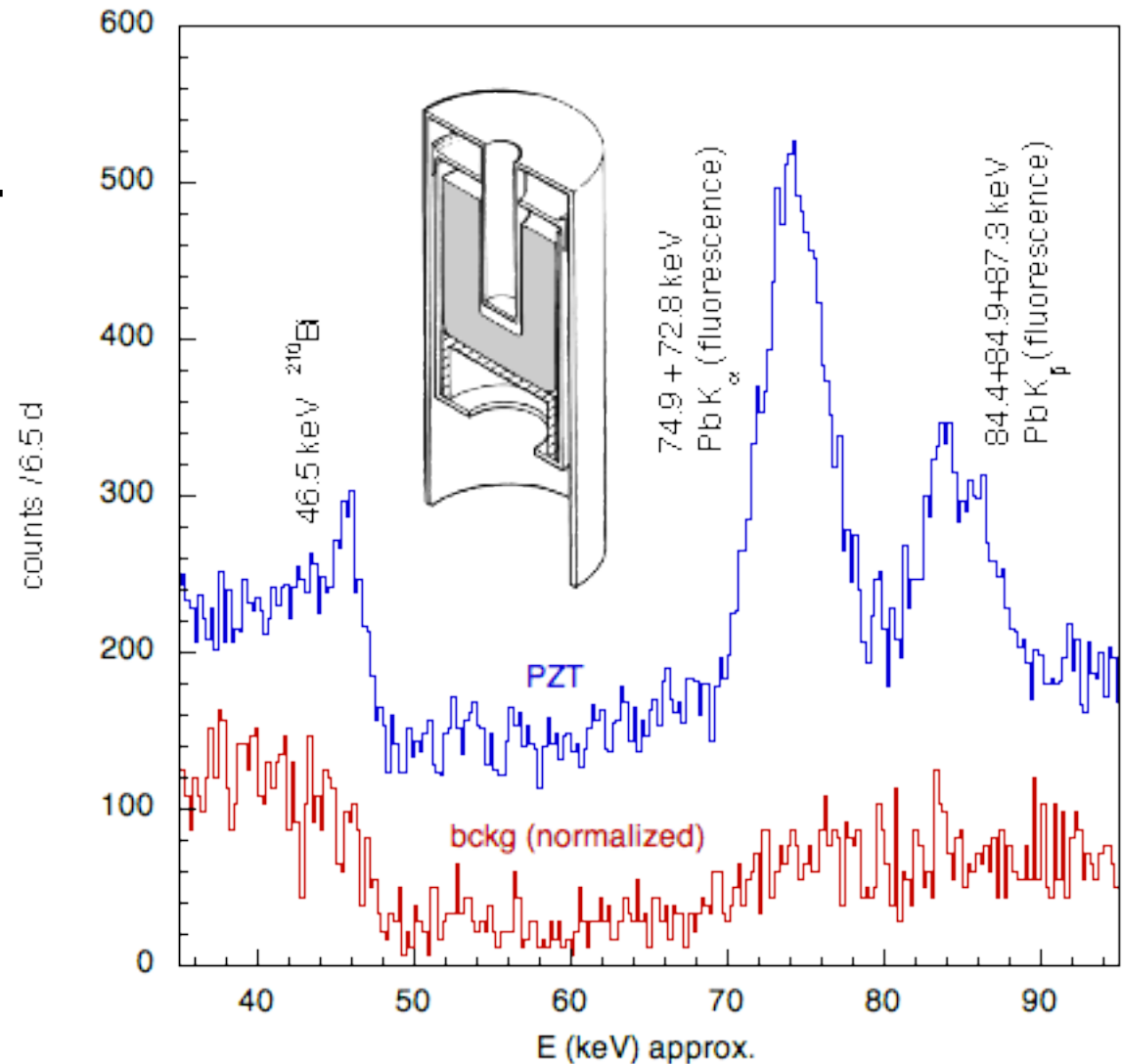
Next trip to SNOLAB

- Top up glycol.
- Assemble new triple encapsulated gamma sources
 - 100 μCi Co-60
 - 1 mCi Ba-133

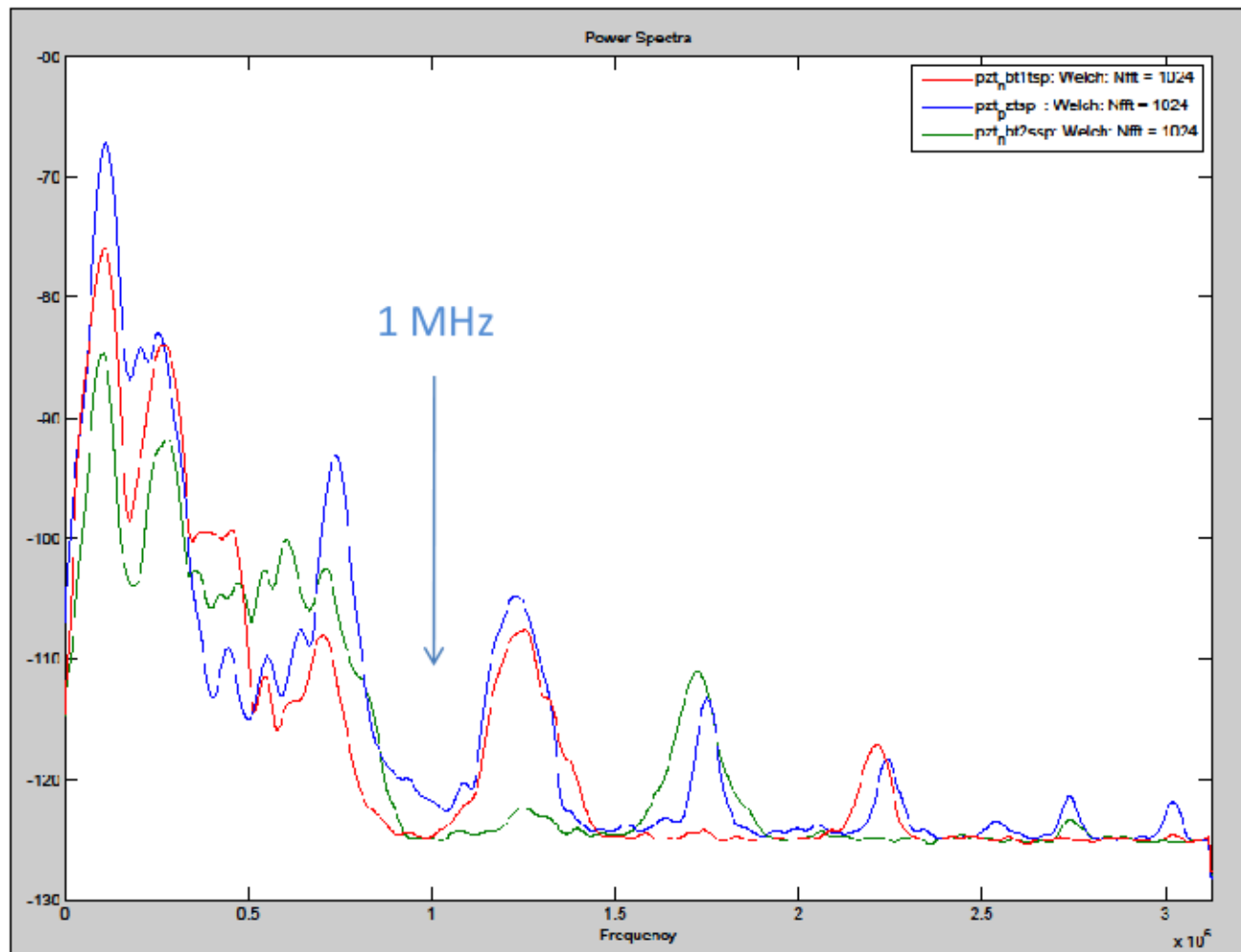


Background from Acoustic Sensors

- (α, n) background
- Pb containing PZT piezoelectric acoustic sensors to be replaced.

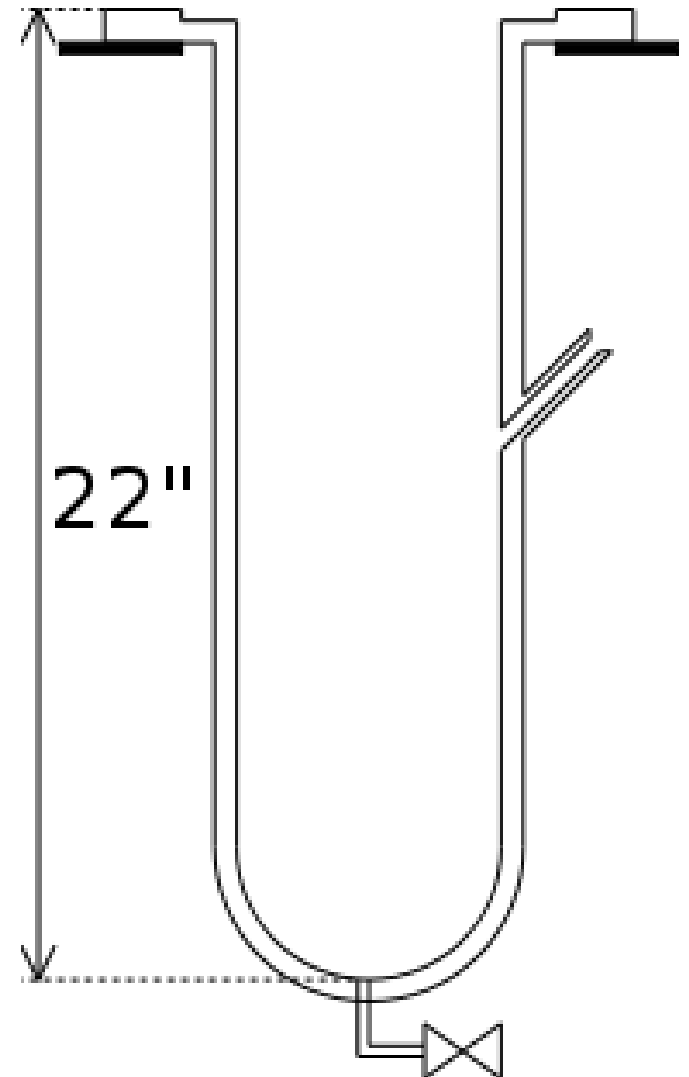


Non-leaded piezos

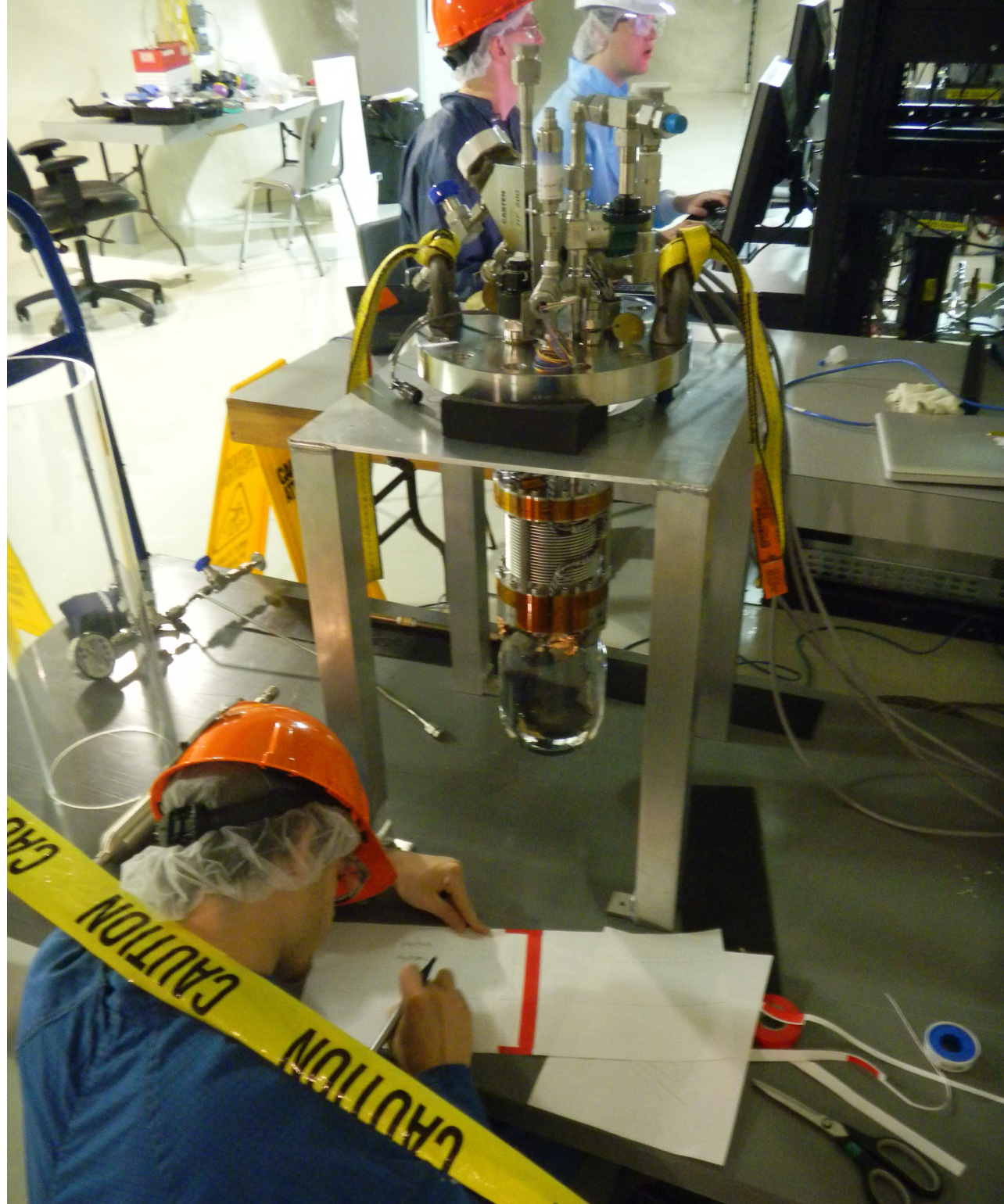


Replacing piezos

- Need to soak J-B Weld in Methyl Ethyl Ketone
 - Construct MEK compatible polypropylene container
 - Use flammable and toxic solvent underground. Similar hazards to methanol.



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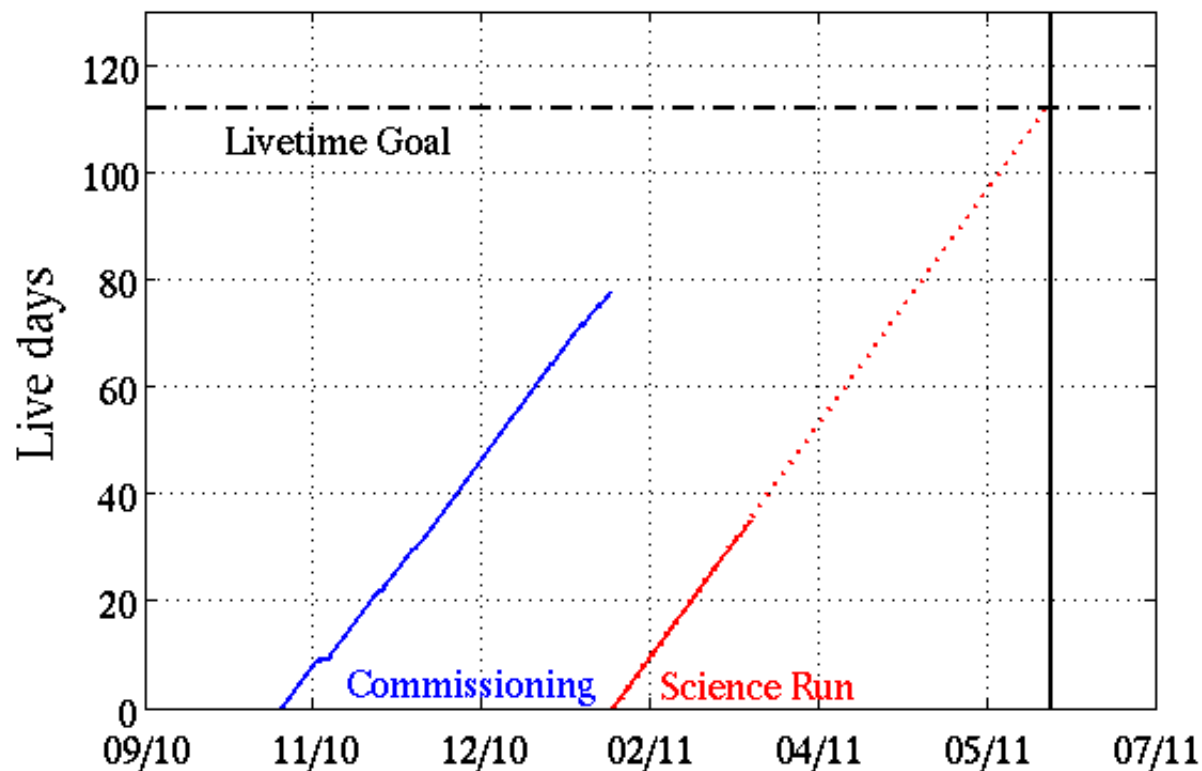


Gamma background counting

- Opportunity to count gamma background in COUPP-4kg using NaI detector.
 - Need to count intrinsic detector background
 - Need holder for detector inside pressure vessel
 - Count the materials we are removing (mostly steel)

Science Running

- 34°C, ~14 keV threshold, 130 calendar days
- Working to characterize potential backgrounds



Acknowledgements

- Fermilab PPD
 - Mark Rushman, Russ Rucinski
- SNOLAB
 - Fraser Duncan, Associate Director
 - Eric Vasquez Jauregui
 - Mechanical Staff
 - and many more ...